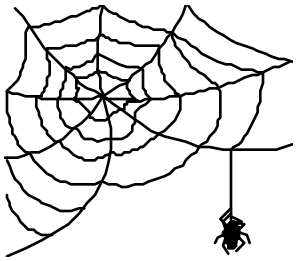
WATER WORKS

Objectives:

In this modified Project WET activity, students will:

- examine the many different ways to use water
- discuss the impact each one has on other water users.



Materials:

- Two jugs of water – one labeled "groundwater", the other "surface water"
- Ball of string or yarn
- *Description of Water Users* cards (pasted on 3 x 5 cards)

Procedure:

1. Have students make a list of the different ways they use water. Introduce the concept that water can be used both directly (washing your hands) and indirectly (eating an apple). After mentioning this, add to the original list.
2. Pass out *Water Users* cards giving one to each student. Have the students silently read the description of his or her water user. Ask water users to consider how they depend on products and services supplied by other users.
3. Have students stand in a circle around the water jugs. Attach the jugs by the handles with the yarn. The teacher will stand in the middle at the jugs. Explain that the jugs represent all water and the yarn represents our need for water.
4. Select a student to describe the goods or services his or her water user provides and how they use water. Pass the ball of yarn to that student. Have them wrap the yarn loosely around one finger and then pass it back to the center. In the center, wrap the yarn around the jug handles one time.
5. After each student has done this, pass the yarn to one student. Have that student read his or her card. Ask the other students to raise their hands if they use the goods or services offered by that student. Have the person with the yarn pass the ball of yarn to one of the students who raised their hand. (The student passing the yarn should hold on to the yarn so he/she is connected to the new student.) Repeat this until all of the students are connected in a web like formation.
6. To emphasize the interdependence of the water users, ask one student to tug gently on their section of yarn. Ask the other students if they can feel it. If they can, have them tug on their yarn. They will understand that all water users are connected and that we all depend on each other to enjoy our fair share of water.
7. If the water jugs in the middle ever get raised up or tip over, explain that the water supply is being overextended. The users are using too much water and the supply is feeling the stress.

Extension:

At lunchtime, ask the students to bring back one item from their lunch. It can be anything from a can to a bag to a granola bar to a piece of fruit. Ask the students to get into 4 groups. From those four groups, ask each student to choose one item that was brought back from lunch. Ask the groups to make a diagram of how that item got to them today and how much

water it took to make it. Encourage them to think of every step of the process, including any farming, mining, transporting, coloration, etc. Allow them time to discover these steps before you suggest them. Have each group make a presentation to the class.

Description of Water Users

Agriculture: Water is used to produce food and fiber for processing and consumption.	**Logging: Water is used to grow and harvest trees**.
Sugar cane grower: Uses water to irrigate crops and transport chemicals (pesticides and fertilizers) to crops.	Forest manager: Uses water to support tree growth and control fires.
Cattle ranchers: Uses water to grow food and provide drinking water for cattle, and to clean their areas for living and feeding, transporting waste to holding ponds.	Logging company: Uses water to float rafts of logs (on rivers and lakes) to collection points.
Fish farmer: Uses water to raise fish to maturity in rearing ponds, and to carry wastes from the ponds.	**Transporting/Shipping: water (rivers, seas, oceans) is used to transport raw materials and finished products to points of distribution (ports).**
Wheat farmer: Uses water to irrigate crops.	Slurry pipeline owner: Uses water to transport pulverized coal through pipelines to distant coal-fired power plants.
Dairy framer: Uses water to grow food and provide drinking water for cows, and to sanitize milking equipment and stalls.	Ship's crews: Uses water to haul raw materials (e.g. logs, oil, wheat) and finished products (e.g. automobiles, appliances, food) to points of transfer.
Mining: Water is used in the extraction process of raw materials (coal, iron, gold, copper, sand, and gravel).	**Business/Industry: Water is used in processing and manufacturing of goods (cars, food, medical supplies, etc.).**
Miner: Uses water to carry and wash rock material during the mineral removal process.	Steel producer: Uses large volumes of water to process iron ore into steel.
Sand and gravel company: Uses water to wash fine soils and rock material out of sand and gravel. Sand and gravel are used in cement and road construction.	Textile manufacturer: Uses water to wash and process raw materials (e.g. wool, cotton, mohair). Dye is mixed with water to color fabric.

Wildlife: Water provides habitat for countless plant and animal species.	Soft drink company: Uses water to produce soft drinks and to sanitize equipment.
Mammals: Beavers, muskrats, and otters live in and near waterways.	Paper mill: Uses water to transport pulp fibers for papermaking and to carry away waste.
Fish: Trout, salmon, and others live in water and eat organisms that live in water.	Chemical manufacturer: Uses water in the production of pesticides and fertilizers.
Insects: Aquatic insects are a food source for many other organisms.	**Power Generation: Water is used to generate electricity.**
Vegetation: Trees and other plants use water in photosynthesis and to transport nutrients.	Hydropower plant: Water flowing in rivers is stored behind dams in reservoirs. As the dam releases water, it turns turbines that generate electricity.
Recreation: People recreate in and around water for exercise and enjoyment.	Nuclear power plant: Uses water in cooling towers to maintain safe operation temperatures.
Cruise ship: People travel to many parts of the world in cruise ships.	Coal-fired power plant: Burning coal produces steam heat that turns turbines, creating electricity.
Fishing: People catch fish in rivers, lakes, and oceans.	**Community: community members use Water for domestic, maintenance, and recreational uses.**
Water theme park: Uses water to transport people on exciting and fun rides.	Domestic users: Water is used in a multitude of ways in and around the home.
Scuba diver: People enjoy exploring underwater environments.	Fire department: Uses water to extinguish fires.
Winter sports: Snow and ice provide fun for skaters, skiers, and sledders.	Restaurant owner: Uses water to cook meals, clean the kitchen, wash tables and floors, and water lawns.
Park: Uses water in fountains and reflecting ponds and for landscaping needs.	Street cleaner: Uses water to wash oil, litter, and other materials from streets.